CLAIMS:

1. An RFID device for non-contact communication with other RFID devices (1, 2, 2', 2'', 2''') of an RFID system by means of modulated electromagnetic signals (SS), which contain data and/ or commands packed in data frames, in which a group of data frames (D-SYNC) contains synchronization information (Preamble, Start Delimiter) for synchronization of mutually communicating RFID devices, and another group of data frames (D-NOSYNC) does not contain any such synchronization information, with synchronizing means (14, 20, 21) configured to effect synchronization of the RFID device by synchronizing information (Preamble, Start Delimiter) contained in received data frames and with synchronization status test means (15, 15', 15''', 22) configured to detect whether the RFID device (2, 2', 2'', 2''') runs synchronously with at least one other RFID device (1) of the RFID system, from which it receives data frames, and in the event of not running synchronously to switch on the synchronizing means (14, 20, 21), in which event the synchronizing means can preferably be switched off automatically after the synchronization has been effected.

2. An RFID-device as claimed in claim 1, in which the synchronizing means (14) are configured in such a manner that every received data frame is to be treated as a data frame containing synchronization information.

3. An RFID device as claimed in claim 1 or 2, in which the synchronization status test means (15') cooperate with a data frame error counter (16) to count the number of erroneously received data frames and in the event of exceeding of a specified error limit, to switch on the synchronizing means (14).

4. An RFID device as claimed in claim 3, in which the synchronization status test means (15') are configured to switch off the synchronizing means (14) in the event of a correctly received data frame.

5. An RFID device as claimed in claim 1 or 2, in which the synchronization status test means (15) are configured for detection of the synchronization start signals (BS) in the received electromagnetic signals (SS), which synchronization start signals (BS) are transmitted outside the data frame, where the synchronization status test means (15) switch on the synchronizing means (14) on detection of a synchronization start signal (SS).

6. An RFID-device as claimed in claim 5, in which the synchronization status test means (15) are configured to detect the degree of modulation of the received electromagnetic signals (SS) and to recognize as a synchronization start signal (BS) a received electromagnetic signal (SS) whose modulation factor lies in a specified range.

7. An RFID device as claimed in claim 6, in which the synchronization status test means (15) are configured to recognize as a synchronization start signal (BS), a received electromagnetic signal whose modulation factor is over 50% up to complete field disconnection (= modulation factor 100%).

8. An RFID-device as claimed in claim 1 or 2, in which the synchronization status test means (15'') cooperate with a Watchdog-Timer (17) to switch on the synchronizing means (14) after the lapsing of a specified interval, during which no or no correct data frame could be received.

9. An RFID-device as claimed in claim 1 or 2, comprising synchronization status test means (22) and two synchronizing means (20, 21), which can be run alternately in such a manner that one of the synchronizing means (21) process every received data frame as a data frame (D-SYNC) containing synchronization information and try to read their synchronization information (Preamble, Start Delimiter) for executing a synchronization routine, while the other synchronizing means (20) forward every received data frame to the next data frame processing means (12), where the operation of the two synchronization means (20, 21) is switched over if a synchronization routine of a synchronization unit (21) is successful.

10. An RFID-device as claimed in any one of the preceding claims, in which the RFID-device is configured as a reading device or transponder (2, 2', 2'', 2''').

11. An RFID system, comprising at least one reading device (1) and at least one transponder (2, 2', 2'', 2'''), which are configured for non-contact communication by means of modulated electromagnetic signals (SS), which contain data and/ or commands packed in data frames, in which the reading device (1) is configured for transmitting a group of data frames (D-SYNC), which contain synchronization information (Preamble, Start Delimiter) for synchronization with the transponder (2, 2', 2'', 2''') and to transmit another group of data frames (D-NOSYNC) which do not contain such synchronization information, in which the transponder (2, 2', 2'', 2''') has synchronization means (14, 20, 21) which are configured to effect synchronization with the reading device (1) with the help of synchronization information (Preamble, Start Delimiter) contained in received data frames (D-SYNC) and synchronization status test means (15,15',15",22) configured for detecting whether the transponder runs synchronously with the reading device and in the event of it not running synchronously to switch on the synchronization means (14, 20, 21) where the synchronization means can preferably be switched off automatically on successful synchronization.

12. An RFID system as claimed in claim 11, in which the reading device (1) is configured to register the inventorizing commands, by which each transponder (2, 2', 2'', 2''') present in an effective area of the reading device, is asked to report to the reading device to send in a data frame (D-SYNC) containing synchronization information.

13. An RFID system as claimed in claim 11 or 12, in which the synchronization status test means (15') cooperate with a data frame error counter (16) to count the number of erroneously received data frames and in the event of exceeding of a specified error limit, to switch on the synchronizing means (14).

14. An RFID system as claimed in claim 13, in which the synchronization status test means (15') are configured to switch off the synchronizing means (14) in the event of a correctly received data frame.

15. An RFID system as claimed in claim 11 or 12, in which the reading device (1) is configured to send synchronization start signals (BS) as electromagnetic signals before data frames (D-SYNC) containing synchronization information, and the synchronization status test means (15) of the transponder are configured for detecting the synchronization

start signals (BS) in the received electromagnetic signals (SS) and to switch on the synchronization means (14) on detection of a synchronization start signal (BS).

16. An RFID system as claimed in claim 15, in which the reading device (1) is configured for sending an electromagnetic signal as a synchronization start signal (BS), the modulation factor of which lies in a specified range and the synchronization status test means (15) are configured to detect synchronization start signals (BS) from the modulation factor of the received electromagnetic signals (SS).

17. An RFID system as claimed in claim 16, in which the reading device (1) is configured for sending an electromagnetic signal (SS) as a synchronization start signal (BS) with a modulation factor of over 50% up to complete field disconnection.

18. An RFID system as claimed in claim 11 or 12, in which the synchronization status test means (15'') cooperate with a Watchdog-Timer (17), to switch on the synchronizing means (14) after the lapsing of a specified interval, during which no or no correct data frame could be received.

19. An RFID system as claimed in claim 11 or 12, comprising synchronization status test means (22) and two synchronizing means (20, 21), which can be run alternately in such a manner that one of the synchronizing means (21) processes every received data frame as a data frame containing synchronization information and tries to read their synchronization information for executing a synchronization routine, while the other synchronizing means (20) forwards every received data frame to the next data frame processing means (12), where the operations of the two synchronization units (20, 21) are switched over if a synchronization routine of one synchronization means is successful.

20. An anti-collision method for determining a number of transponders in an effective area of a reading device, comprising the providing of at least one reading device (1) and a number of transponders (2, 2', 2'', 2'''), in which the reading device communicates with the transponders without contact by means of modulated electromagnetic signals (SS), which contain data and/ or commands packed in data frames (D-SYNC, D-NOSYNC), in which the reading device (1) transmits an inventory command for determination of the transponders (2, 2', 2'', 2''') present in its effective area, by which command each

transponder (2, 2', 2'', 2''') present in the effective area of the reading device is asked to transmit a response with a unique identification number to the reading device (1), upon which the reading device (1) sends the Inventory command in a data frame (D-SYNC), which contains synchronization information (Preamble, Start Delimiter) for synchronization with the transponders, when the transponders synchronize with the reading device with the help of the synchronization information contained in the received data frame, in which the reading device (1) transmits a repeat command in case there are mutually colliding responses from several transponders (2, 2', 2'', 2'''), which command causes the transponders to send the response once more and in which the reading device on the transponder whose response was received without errors, sends a Confirm command, which causes this transponder not to react to repeat commands, in which the reading device continues transmission of Confirm commands and Repeat commands, until no transponder responds any longer within a specified interval, in which the reading device transmits the Repeat commands and / or the Confirm commands in data frames (D-NOSYNC) , which do not contain synchronization information.

21. An anti-collision method as claimed in claim 20, in which the transponders respond to the reading device at randomly selected delays.

22. An anti-collision method as claimed in claim 21, in which the delay selectable by the transponder lies in a round, which has a number of time slots which are pre-defined and possibly variable by the reading device with durations, which are defined and possibly variable by the reading device.

23. An anti-collision method as claimed in claim 22, in which the reading device transmits nothing more than a Confirm command or a Repeat command per time slot, where a time slot is optionally early scheduled by these commands.

24. An anti-collision method as claimed in any one of the claims 22 or 23, in which the Repeat command triggers the transponders to start a new round.

25. An anti-collision method as claimed in any one of the claims 22 to 24, in which the reading device sends a Next Time Slot command, if no transponder responds

within a time slot, where the Next-Time slot command is preferably sent in a data frame (D-SYNC) with synchronization information.

26. An anti-collision method as claimed in any one of the claims 22 to 25, in which the anti-collision method is scheduled if no transponder responds within a round.